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Correlation of Stress Levels and the Incidence of *Pityriasis Sicca* in Final Year Students of the Faculty of Medicine, Universitas Sumatera Utara Class of 2017

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Abstract. Background: *Pityriasis sicca* is a non-inflammatory skin disorder. The symptoms such as white or gray scales that accumulate on the surface of the scalp or in a localized place, peels easily and usually with itching. There are three main factors that cause *Pityriasis sicca*. Stress stimulates the body to increase sebum production in the sebaceous glands. **Objective:** To know the correlation between stress levels and incidence of *Pityriasis sicca* in the final year students of the Faculty of Medicine, Universitas Sumatera Utara class of 2017. **Methods:** This was an analytical study with a cross-sectional design, started from July 2020 until October 2020. Sampling was carried out using a total sampling technique. The data were obtained using univariate and bivariate statistical analysis. **Results:** Univariate analysis showed 102 respondents were at a normal stress level (40.3%) and there were 105 respondents (41.5%) who suffered from *Pityriasis sicca*, total samples were 253 respondents. From the bivariate analysis, it was found that there is a significant correlation between stress levels and the incidence of *Pityriasis sicca*. **Conclusion:** There is correlation between stress levels and the incidence of *Pityriasis sicca* in class 2017 students of the Faculty of Medicine, Universitas Sumatera Utara.

Keyword: *Pityriasis sicca*, Dandruff, Stress, Sebum, *Malassezia sp.*

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1 Introduction

Pityriasis sicca also known dandruff, *Pityriasis simplex capillitii*, *Pityriasis capitis* or *Pityriasis furfuracea* [1]. *Pityriasis sicca* is characterized by a white or gray scales that accumulate on the surface of the scalp or in a localized place, easily peels off, and is usually accompanied by itch. There are three major factors causing *Pityriasis sicca*, such as activity of sebaceous gland, microflora metabolism, and individual susceptibility [2]. Metabolism of microflora such as *Malassezia sp.* considered as the main etiopathological factor of the incidence of *Pityriasis sicca* [3]. On a normal scalp, *Malassezia sp.* represents 45% total population microflora, while on the scalp of people with *Pityriasis sicca* the proportion increases to 75% [4]. Proliferation of the

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population *Malassezia sp.* strongly related to the increased activity of the sebaceous glands and generation of symptoms (such as inflammation of the scalp, irritation and peeling) as well as associated with deconstruction disorders the *stratum corneum* [3].

Pityriasis sicca is the most common skin disease, it is estimated that about 50% of the world's population suffered *Pityriasis sicca* [5]. Surveys in the US show that about 50 million people suffer from *Pityriasis sicca* [6]. The prevalences of *Pityriasis sicca* in Indonesia according to data from the International Date Base, U.S. Census Bureau in 2004 was 43,833,262 out of 238,452,952 people and ranked fourth after China, India, and USA [7]. The incidence rate of *Pityriasis sicca* starts from puberty and the peak period at twenty years old, then the incidence rate decreases after fifty years old and rare in children.

Some individuals are more susceptible to irritating effects of *Malassezia sp.*, factors such as stress, age, hormones, and poor hygiene can cause increase in *Malassezia sp.* population and worsening of *Pityriasis sicca* symptoms [8]. Stress often occurs in academic environment, whether studying at the school or in college. This is due to high academic demands such as exams, tasks, and etc [9]. A final year-student have obligation to make a thesis as a requirement to get a degree. Making a thesis is not easy, especially the thesis must be done when the student have another assignments, lectures, Objective Structured Clinical Examination (OSCE) and final exams to attend. These factors trigger stress level of final year students.

2 Methods

This was an analytical study with cross sectional design. The research was conducted from 1st July to 25th October 2020 at the Faculty of Medicine, Universitas Sumatera Utara. The population were the final year students of the Faculty of Medicine, Universitas Sumatera Utara. The research used total sampling method. The inclusion criteria were final year students of the Faculty of Medicine, Universitas Sumatera Utara Class of 2017 who are willing to sign informed consent. The exclusion criteria were students that suffering from psoriasis, using oral or topical antimicotic such as drugs, cream, ointment, or shampoo. Total samples obtained 253 students as research subjects.

The data obtained directly from respondents using form of Depression Anxiety and Stress Scale (DASS) and questionnaires about *Pityriasis sicca* as measurement instruments and scalp examination. Then, data were processed by computer software, Program Statistic Package for Social Science (SPSS) Statistics 21. a hypothetical test was conducted to find correlation of stress levels and incidences of *Pityriasis sicca* using Chi-square analysis. Hypothesis 0 (H0) accepted if pValue < 0.05.

3 Results and Discussion

Univariate analysis was used to describe the characteristics of respondents, stress levels and incidence rates of *Pityriasis sicca*.

Table 3.1 Distribution of Respondents by Gender

Gender	Frequency	Percentage (%)
Male	102	40.3
Female	151	59.7
Total	235	100

Based on table 3.1, the majority respondents were female with a total of 151 people (59.7%).

Table 3.2 Distribution of Respondents by Age

Age	Frequency	Percentage (%)
19 years – 19 years 11 months	6	2.4
20 years – 20 years 11 months	79	31.2
21 years – 21 years 11 months	132	52.2
22 years – 22 years 11 months	28	11.1
23 years – 23 years 11 months	5	1.9
24 years – 24 years 11 months	1	0.4
25 years – 25 years 11 months	2	0.8
Total	253	100

Based on table 3.2, respondent's age range were 19 years - 25 years 11 months. Majority respondent come from 21 years – 21 years 11 months group, 132 respondents (52.2%) and there was only 1 respondents (0.4%) who is included in the range age of 24 years – 24 years 11 months.

To measure respondent's stress level was used Depression Anxiety and Stress Scale (DASS) questionnaire. 14 out of 42 questions on the Depression Anxiety and Stress Scale (DASS) questionnaire were used to measure stress levels. Each question was scored 0 to 3. Total scores of 14 question would determined which classification stress level was. Stress level classified into normal, mild, moderate, heavy and very heavy stress levels.

Table 3.3 Distribution of Respondents Based on Stress Levels

Stress Levels	Frequency	Percentage (%)
Normal	102	40,3
Mild	48	19,0
Moderate	64	25,3
Heavy	26	10,3
Very heavy	13	5,1

Total	253	100
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Based on table 3.3, 102 respondents (40.3%) had normal stress level and 13 respondents (5.1%) had very heavy stress level.

Diagnosis of *Pityriasis sicca* in respondents established by using questionnaire about symptoms of *Pityriasis sicca* and scalp examination. Scalp examination was done by each of respondents sent their scalp's photos, respondents were asked to wash their hair 1-2 days before the scalp examination, then takes a photo of specific zone of their scalp that felt itchy or had white or gray scales and sends it to researcher. Diagnosis of *Pityriasis sicca* was established if a white or gray scales found on the respondent's scalp or hair.

Table 3.4 Distribution Incidence of *Pityriasis sicca*

<i>Pityriasis Sicca</i>	Frequency	Percentage (%)
Suffer	105	41.5
Do not suffer	148	58,5
Total	253	100

Based on table 3.4, 105 respondents (41.5%) suffered from *Pityriasis Sicca*.

Chi square test was conducted to find correlation of stress levels and the incidence of *Pityriasis sicca* in final year students of the Faculty of Medicine, Universitas Sumatera Utara class of 2017.

Table 3.5 Correlation of Stress Levels with Incidence of *Pityriasis sicca*

Stress Levels	<i>Pityriasis Sicca</i>				Total		Sig (p)
	Suffer		Do Not Suffer				
	f	%	f	%	f	%	
Normal	32	12,6	70	27,7	102	40,3	0.002
Mild	19	7,5	29	11,5	48	19,0	
Moderate	27	10,7	37	14,6	64	25,3	
Heavy	19	7,5	7	2,8	26	10,3	
Very heavy	8	3,2	5	2,0	13	5,1	
Total	105	41,5	148	58,5	253	100	

Table 3.5 showed 105 respondents (41.5%) out of 253 respondents who suffered from *Pityriasis sicca*. From the 105 respondents who suffered from *Pityriasis sicca*, 32 respondents (12.6%) under normal stress level, 19 respondents (7.5%) under mild stress level, 27 respondents (10.7%) under moderate stress level, 19 respondents (7.5%) in a state of heavy stress level, and 8 respondents (3.2%) in a very heavy state level. The p value or the critical value then obtained using Chi square analysis, in this case equal 0.002, which means there was correlation between stress levels and the incidence of *Pityriasis sicca* statistically.

In a study conducted by Saif [10], found that psychological stress in medical students can cause various types of skin disorders such as hair loss (67.2%), the onset of acne (63.1%), oily scalp and the incidence of *Pityriasis sicca* (49.5%), also itch of the scalp (40.5%). The results of this study also supported by previous research conducted by Yuni and Utami [11] titled factors that cause the incidence of *Pityriasis sicca*, they obtained results that respondents with heavy stress levels had 8.5 times greater risk of *Pityriasis sicca* compared to respondents who had mild stress.

There are several factors that affect the incidence of *Pityriasis sicca*, such as demographic differences (age, gender, and race), health history (history of having eczema and psoriasis), lifestyle (hygiene, food intake, improper use of hair products), environmental factors (environmental humidity, pollution and exposure to excessive sunlight), and psychological factors such as stress [12].

Physiologically, one of the body's responses to stress is activation of the hypothalamic adrenal pituitary axis (HPA axis). Activation of the HPA axis release of corticotropin releasing factor (CRF) which stimulates the pituitary gland to secrete adrenocorticotrophic hormone (ACTH). ACTH will stimulate increased production of sebaceous glands so that increase sebum levels [13]. Increased levels of sebum will affect the number of population *Malassezia sp.* because of the availability of nutrients to grow and proliferate. *Malassezia sp.* will hydrolyze triglycerides in sebum into saturated fatty acids and unsaturated fatty acids. Saturated fatty acids will trigger the production of inflammatory mediators and damage to the stratum corneum causing irritation and hyperproliferation of the epidermis that will give a scales picture of the scalp as known as *Pityriasis sicca* [14].

4 Conclusion

Based on the results of research and discussion of the data, it can be concluded that:

1. There was correlation between stress levels and the incidence of *Pityriasis sicca* in final-year students of the Faculty of Medicine, Universitas Sumatera Utara class of 2017.
2. Final year students of the Faculty of Medicine, Universitas Sumatera Utara class of 2017 were mostly at normal stress levels (40.3%).

3. Students of the final level of the Faculty of Medicine, many of Universitas Sumatera Utara class of 2017 suffer from *Pityriasis sicca* (41.5%).

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